

REMARKS

Claims 1-8 and 10-17 are pending in the application.

Claims 7, 8 and 10-13 have been withdrawn as the result of a restriction requirement.

Claims 1-3, 5, 14 and 16 have been canceled without prejudice or disclaimer.

Claims 4, 6, 15 and 17 have been amended to address several informalities and to further clarify the claimed invention.

CLAIM OBJECTIONS

The Examiner objects to claims 4, 6, 15 and 17 as containing informalities. These claims have been amended to address the issues raised by the Examiner. Therefore, the Examiner is requested to withdraw the objections to these claim.

CLAIM REJECTIONS

The 35 U.S.C. § 102(e) rejections of claims 1, 2, 5, 14 and 16 are moot given that these claims have been canceled.

The Examiner has rejected claims 1 and 4-6 under 35 U.S.C. § 102(e) as being anticipated by Imaoka (U.S. 2004/0245649). The rejections of claims 1 and 5 are moot given that they have been canceled. Applicants traverse the rejections of claims 4 and 6 because Imaoka fails to disclose or suggest all of the claim limitations. Specifically, Imaoka fails to disclose or suggest at least the following limitations:

Claim 4:

an insulating resin layer formed on all of at least one surface of said through wiring board except for the area where said through hole is opened and wherein said insulating resin layer is not formed on any surfaces in said through hole;

Claim 6:

forming an insulating resin layer on all of at least one surface of said through wiring board except for the area where said through hole is opened and wherein said insulating resin layer is not formed on any surfaces in said through hole;

One feature of claims 4 and 6 is that an insulating resin layer is formed on all of at least one surface of said through wiring board except for the area where said through hole is opened. An example of this feature is shown in Figure 7, where resin layer 14 covers the bottom surface of the board member 7 except in the area of the through hole 3. An advantage of this feature, although this advantage is not required, is that when the insulating resin layer, which is formed on all of the surface of said through wiring except for the area where said through hole is opened, it is possible to ease the stress applied through the bump during implementation and improve the insulation property. See for example, paragraph [56].

In contrast, Imaoka fails to disclose at least this feature. As seen in figure 3, layer 36 is provided on only part of the surface of the board that is under the bump or one part under the wiring. Therefore, Applicants request that the anticipation rejections based in Imaoka be withdrawn.

The Examiner has rejected claims 1 and 3-6 under 35 U.S.C. § 103(a) as being unpatentable over Hanaoka (U.S. 2002/0030245) in view of Lee (U.S. 6,844,627). The rejections of claims 1, 3 and 5 are moot given that they have been canceled. Applicants traverse the rejections of claims 4 and 6 because the cited references fail to disclose or suggest all of the claim limitations. Specifically, they fail to disclose or suggest at least the following limitations:

Claim 4:

an insulating resin layer formed on all of at least one surface of said through wiring board except for the area where said through hole is opened and wherein said insulating resin layer is not formed on any surfaces in said through hole;

a through extension wiring with which said through hole is completely filled and which is formed on said insulating resin layer on said at least one surface of said through wiring board to extend to a position at a predetermined distance from said through hole; and

Claim 6:

forming an insulating resin layer on all of at least one surface of said through wiring board except for the area where said through hole is opened and wherein said insulating resin layer is not formed on any surfaces in said through hole;

forming a through extension wiring on said at least one surface of said insulating resin layer to completely fill said through hole and extend to a position at a predetermined distance from said through hole; and

Features of claims 4 and 6 include an insulating resin layer is formed on all of at least one surface of said through wiring board except for the area where said through hole is opened and wherein the insulating resin layer is not formed on any surfaces in said through hole. In addition, there is a through extension wiring the completely fills the through hole.

The Examiner alleges that insulating layer 10 is the claimed insulating resin layer. However, layer 10 covers the interior surface of through hole 4, which is contrary to the claimed invention.

In addition, as the Examiner correctly notes, Hanaoka does not disclose or suggest a through wiring completely filling the through hole. In order to make up for this deficiency, the Examiner cites to Lee. However, one skilled in the art would not combined the teachings in Lee to the Hanaoka device because Hanaoka explicitly teaches away from filling the through hole. The Examiner argues that Hanaoka addresses the reduction of voids in paragraph [0177] and for

that reason, one of skill in the art would have filled the through hole 4. However, the Examiner is misinterpreting paragraph [0177], which states that because the conductive layer is on the surface of the through hole, it is not necessary to put a solid conductor in the through hole. Therefore, voids that can be created when a through hole is filled with a solid conductor can be avoided.

The Examiner has rejected claims 4, 6, 15 and 17 under 35 U.S.C. § 103(a) as being unpatentable over Takao in view of Hanaoka. Applicants traverse the rejections of claims 4, 6, 15 and 17 because the cited references fail to disclose or suggest all of the claim limitations. Specifically, they fail to disclose or suggest at least the following limitations:

Claim 4:

an insulating resin layer formed on all of at least one surface of said through wiring board except for the area where said through hole is opened and wherein said insulating resin layer is not formed on any surfaces in said through hole;

a through extension wiring with which said through hole is completely filled and which is formed on said insulating resin layer on said at least one surface of said through wiring board to extend to a position at a predetermined distance from said through hole; and

Claim 6:

forming an insulating resin layer on all of at least one surface of said through wiring board except for the area where said through hole is opened and wherein said insulating resin layer is not formed on any surfaces in said through hole;

forming a through extension wiring on said at least one surface of said insulating resin layer to completely fill said through hole and extend to a position at a predetermined distance from said through hole; and

The Examiner concedes that Takao fails to disclose an insulating resin on the surface of the wiring board and cites to Hanaoka to make up for the deficiency. However, one of skill in the art would not have been motivated to combine the teachings of Hanaoka with Takao to arrive

at the claimed invention. The Examiner asserts that one of skill in the art would have added the insulating resin of Hanaoka to the Takao device in order to improve electrical insulation between a conductive material and IC devices. However, there is already an insulator that protects the conductive material from the IC device - insulating layer 30 (see pars. [0050] and [0059]). Therefore, there would be no need to add another processing step to add another insulator. In addition, if the insulating resin 10 of Hanaoka were added to the Takao device, following the teachings of Hanaoka, it would also cover the interior surface of the through hole, which is precluded from the claim.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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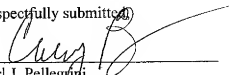
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Respectfully submitted,



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